LISTING OF CLAIMS:

1. (Original) A robot, the robot comprising:

a barcode scanner with a scan path, wherein the barcode scanner is affixed to the robot;

an attenuation surface affixed to the barcode scanner, wherein the attenuation surface is located such that at least one end of the scan path of the barcode scanner is controlled by the attenuation surface;

a positional encoding device for determining the location of the attenuation surface with respect to a target associated with at least one storage cell.

2. (Original) The robot as recited in claim 1, wherein the attenuation surface comprises a plurality of edges and wherein at least one of the edges are beveled.

3. (Original) The robot as recited in claim 1, wherein the attenuation surface is constructed from a material that is formable into sharp edges.

4. (Original) The robot as recited in claim 1, wherein the attenuation surface reflects light from a scanner illumination source in a non-detrimental manner.

5. (Original) The robot as recited in claim 1, wherein the attenuation surface controls one or more ends of the scan path during movement of the robot parallel to the scan path in order to determine a target position in a first coordinate frame.

6. (Original) The robot as recited in claim 1, wherein the movement of the barcode scanner substantially orthogonal to the scan path will determine the target position relative to positional data from the robot in a second coordinate frame.

7. (Original) The robot as recited in claim 1, wherein the target is a barcode.

8. (Original) The robot as recited in claim 1, wherein the attenuation surface comprises a metal.

9. (Original) The robot as recited in claim 1, wherein the attenuation surface is black anodized.

10. (Original) The robot as recited in claim 1, wherein the barcode scanner is a laser scanner.

11. (Original) The robot as recited in claim 10, wherein the laser scanner comprises:

a laser; and

a moveable reflecting surface which reflects light from the laser to an object external to the laser scanner.

12. (Original) A robot, the robot comprising:

a barcode scanner with a scan path, wherein the barcode scanner is affixed to the robot;

a positional encoding device for determining the location of the scan path with respect to a target associated with at least one storage cells within a storage library.

13. (Original) The robot as recited in claim 12, wherein the movement of the barcode scanner substantially orthogonal to the scan path determines the position relative to positional data from the robot.

14. (Original) The robot as recited in claim 12, wherein the target is a barcode.

15. (Original) A positional determination device, the device comprising:

a barcode scanner with a scan path affixed to a moveable object;

an attenuation surface affixed to the barcode scanner, wherein the attenuation surface is located such that at least one end of the scan path is controlled by the attenuation surface; and

a positional encoding device for determining the location of the object with respect to an external object.

16. (Original) A library storage system, the system comprising:

a plurality of storage cells, wherein at least some of the plurality of storage cells include a target;

a robot for moving items to and from the storage cells, wherein the robot includes a barcode scanner with a scan path, an attenuation surface, wherein the attenuation surface is located such that at least one end of the scan path is controlled by the attenuation surface, and a positional encoding device for determining the location of the attenuation surface with respect to the target.

17. (Original) The library storage system as recited in claim 16, wherein at least one of the edges of the attenuation surface is beveled.

18. (Original) The library storage system as recited in claim 16, wherein the attenuation surface is constructed from a material that is formable into sharp edges.

19. (Original) The library storage system as recited in claim 16, wherein the attenuation surface is configured to reflect a scanner illumination source in a non-detrimental manner.

20. (Original) The library storage system as recited in claim 16, wherein the attenuation surface controls at least one end of the scan path during movement of he robot parallel to the scan path to determine target position in a first coordinate frame.

21. (Original) The library storage system as recited in claim 16, wherein the movement of the barcode scanner substantially orthogonal to the scan path

determines the target position relative to positional data from the robot in a second coordinate frame.

22. (Original) The library storage system as recited in claim 16, wherein the target is a barcode.

23. (Original) A method for determining the position of a robot relative to a target, the method comprising:

translating a robot having a barcode scan engine with a scan path having a scan path width controlled by an attenuation surface in a direction substantially parallel to the scan path;

determining a first parallel position at which the target is first readable by the barcode scan engine; and

determining a second parallel position at which the target is first becomes unreadable by the barcode scan engine.

24. (Original) The method as recited in claim 23, further comprising:

determining the center of the target in the parallel direction from the first and second parallel positions.

25. (Original) The method as recited in claim 24, wherein the step of determining the center of the target in the parallel direction comprises assigning a position halfway between the first and second parallel positions as the center position of the target in the parallel direction.

26. (Original) The method as recited in claim 23, further comprising:

translating the robot in a direction substantially perpendicular the scan path;

determining a first perpendicular position at which the target first becomes readable to the barcode scanner; and

determining a second perpendicular position at which the target first becomes unreadable by the barcode scanner.

27. (Original) The method as recited in claim 26, further comprising:

determining the center of the target in the perpendicular direction from the first and second perpendicular positions.

28. (Original) The method as recited in claim 27, wherein the step of determining the center of the target in the perpendicular direction comprises assigning the midpoint between the first and second perpendicular positions as the center of the target in the perpendicular direction.

29. (Original) A system for determining the position of a robot relative to a target, the system comprising:

first means for translating a robot having a barcode scan engine with a scan path having a scan path width controlled by an attenuation surface in a direction substantially parallel to the scan path;

second means for determining a first parallel position at which the target is first readable by the barcode scan engine; and

third means for determining a second parallel position at which the target is first becomes unreadable by the barcode scan engine.

30. (Original) The system as recited in claim 29, further comprising:

fourth means for determining the center of the target in the parallel direction from the first and second parallel positions.

31. (Original) The system as recited in claim 30, wherein the fourth means comprises assigning a position halfway between the first and second parallel positions as the center position of the target in the parallel direction.

32. (Original) The system as recited in claim 29, further comprising:

fourth means for translating the robot in a direction substantially perpendicular the scan path;

fifth means for determining a first perpendicular position at which the target first becomes readable to the barcode scanner; and

sixth means for determining a second perpendicular position at which the target first becomes unreadable by the barcode scanner.

33. (Original) The system as recited in claim 32, further comprising:

seventh means for determining the center of the target in the perpendicular direction from the first and second perpendicular positions.

34. (Original) The system as recited in claim 33, wherein the seventh means comprises assigning the midpoint between the first and second perpendicular positions as the center of the target in the perpendicular direction.